

REMARKS

After entry of this amendment, claims 1, 5-10, 12, 14, and 17-22 are pending. The claims have been amended or cancelled without disclaimer or prejudice. Support for the amendments is found *inter alia* in the original claims. Amended claim 1 finds support in original claims 1, 2, 4, and 6, in the specification at page 2 lines 11-16, page 4 lines 1-3, page 9 lines 17-21, page 14 lines 1-7, and in Example 8 at page 40. The amendments to claims 10 find support in original claims 2 and 10, and in the specification at page 2 lines 11-12 and page 4 lines 15-16. Claims 5-10, 12, and 14 have also been amended to better comply with U.S. practice. Claims 2-4, 11, 13, and 15-16 have been cancelled without prejudice or disclaimer. Non-elected claims and subject matter are cancelled without prejudice or disclaimer. New claims 17-22 find support in the original claims and in the specification at page 2 lines 28-31 and page 11 lines 29-34. The new claims are consistent with the restriction requirement. No new matter has been added.

Objections To The Claims

The Examiner objects to claims 2-14 for the recitation of "A method." In light of the amendments, this objection is believed to be rendered moot and is respectfully requested to be withdrawn.

The Examiner objects to claims 5-6 and 12 for comprising non-elected subject matter. In light of the amendments, this objection is believed to be rendered moot and is respectfully requested to be withdrawn.

The Examiner objects to claim 11. Claim 11 has been cancelled without disclaimer or prejudice. In light of the amendments, this objection is believed to be rendered moot and is respectfully requested to be withdrawn.

Rejections Under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected for indefiniteness claims 5-6 for the term "homologous." Claims 5 and 6 as amended do not recite "homologous." In view of the amendments, the rejection is believed to be rendered moot and is respectfully requested to be withdrawn.

Rejections Under 35 U.S.C. § 112, First Paragraph

The Examiner rejects claims 1-12 and 14 under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement and on the basis that the specification does not provide an enabling disclosure. Applicants respectfully disagree and traverse the rejections for the following reasons.

Written Description

The Examiner argues that the specification fails to describe the claimed genus of sulfur containing fine chemicals, the claimed genus of polynucleotides encoding metF protein, any genes encoding enzymes (claim 12), or the claimed additional gene of the biosynthetic pathway (claim 10), on the basis that the specification does not describe a representative number of species encompassed by the genus of the claimed sulfur-containing fine chemicals or polynucleotides encoding metF protein. Applicants respectfully disagree, but in order to expedite prosecution, the claims have been amended without prejudice or disclaimer to recite a specific-sulfur containing chemical "L-methionine" and, in one embodiment, an additional gene of the "L-methionine" pathway (claim 10).

The applicable test for written description is stated in the "Guidelines for Examination of Patent Applications Under the 35 U.S.C. 112, 1, Written Description Requirements" 66 Fed. Reg. 1099, 1106 (Jan. 5, 2001). As there indicated, the written description requirement for a claimed genus can be satisfied in a number of alternative ways, such as through sufficient description of a representative number of species by actual reduction to practice, by disclosure of relevant identifying characteristics, by functional characteristics coupled with known or disclosed correlation between function and structure, or by a combination of such identifying characteristics.

The Examiner asserts that the specification teaches the structure of only several representative species of metF genes. Applicants strongly disagree that the structure of twenty-seven polynucleotides as set forth in SEQ ID NO: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, and 53 should be considered as representing only a few polynucleotides. The twenty-seven polynucleotides are further characterized as each

encoding a protein with metF activity. Applicants urge that twenty-seven polynucleotides encoding a protein with metF activity constitutes a representative number of species, particularly considering that the claims as amended recite production of L-methionine.

Furthermore, Example 18 of the "Synopsis of Application of Written Description Guidelines" is particularly relevant, since the claims of the present invention are drawn to methods and not to polynucleotides. The claims in Example 18 of the Guidelines relate to a method of producing a protein and are drawn to a genus, i.e. any of a number of methods that can be used for expressing protein in mitochondria of the organism. Furthermore the recitation of a specific nucleic acid was not essential to the method. There was actual reduction to practice of a single embodiment, and there was no substantial variation within the claimed genus because there are a limited number of ways to practice the process steps.

Similar to Example 18, the present specification describes production of L-methionine by fermenting coryneform bacteria expressing a nucleotide sequence which encodes a protein with metF activity. The present specification also describes an embodiment of the method in which a further gene in the L-methionine biosynthetic pathway is overexpressed or mutated. Additionally, as in Example 18 of the Guidelines, the present specification provides an actual reduction to practice of the method as shown in Example 8. In Example 8, clones, which comprise a nucleotide sequence encoding the protein with metF activity and an additional mutated gene in the L-methionine biosynthetic pathway, were cultured in fermentation, and the desired production of the protein resulted. That process is the same irrespective of the selection of the polynucleotide sequence encoding a metF protein or of the gene in the pathway. As in Example 18 of the Guidelines, the present claims are adequately described.

The Examiner also alleges that the specification fails to describe any additional genes or any methods of amplifying or mutating any gene (see Office Action page 8). In response, in addition to the above remarks, there has never been a requirement that every species encompassed by a claim must be disclosed or exemplified in a working example. *In re Angstadt*, 537 F.2d 498 (CCPA 1976). As pointed out above, the present specification shows a representative number of species having metF activity, and establishes a connection between a coryneform bacterium containing such a gene and production of L-methionine.

For these reasons, it is submitted that the claims as amended are in compliance with the written description requirement. Reconsideration and withdrawal of this rejection is respectfully requested.

Enablement Rejection

The Examiner asserts that the specification does not provide enablement for producing any sulfur containing chemical, for any DNA molecule encoding any metF protein, for any or all genes of the biosynthesis pathway of any sulfur-containing fine chemical (claim 10), or any metabolic pathway. In response, the present claims call for production of L-methionine. The specification and the Examples have shown that expression of a metF protein in a coryneform bacteria increases L-methionine. (See, for example, Example 8 at page 40).

The Examiner further alleges that the scope of the claims is not commensurate with the enablement provided by the disclosure based on what mutations or modifications would be required and the lack of knowledge of the structure/function relationship for such modifications. In response, the claims as amended call for a protein having 95% or more homology to SEQ ID NO: 2 or for a nucleotide sequence having 95% or more identity to SEQ ID NO: 1.

The Examiner also alleges that the scope of the claims is not commensurate with the enablement provided by the disclosure regarding amplification and mutating one gene of the sulfur-containing fine chemical biosynthetic pathway referring to claim 10 (Office Action, pages 12-13). Claim 10 as amended recites the biosynthetic pathway of L-methionine and does not recite amplification or mutation. In light of the amendments to claim 10, this rejection is believed to be rendered moot.

The rejections regarding claim 11 (Office Action, pages 12, 14) are moot as claim 11 is cancelled without disclaimer or prejudice.

In summary, the disclosure is not limited to only several metF genes (see Office Action page 11 lines 6-8), but rather discloses twenty-seven exemplary polynucleotides workable in the claimed process. Furthermore the sulfur-containing fine chemical and pathway are specified as

L-methionine. This extensive disclosure provides guidance and working examples for the skilled artisan to practice the full scope of the process as now claimed.

For these reasons and in light of the amendments, reconsideration and withdrawal of this rejection is respectfully requested.

Rejections under 35 U.S.C. § 102(b)

Claims 1-10, 12, and 14 were rejected as being anticipated by Bathe et al. (WO02/10206, hereinafter "Bathe I"). Applicants respectfully traverse.

The Examiner characterizes Bathe I as disclosing the sequence of a metF (SEQ ID NO: 2) having 349 amino acid residues from *Corynebacterium glutamicum*, which is alleged to be 70% identical to SEQ ID NO: 2 of the present application. Claim 1 as amended in the present application recites the metF protein having the sequence of SEQ ID NO: 2 or a variant with 95% homology to SEQ ID NO: 2. SEQ ID NO: 2 of Bathe I has 349 amino acids whereas SEQ ID NO: 2 of the present application has 327 amino acids. New claim 17 recites that the metF protein is encoded by the nucleotide sequence of SEQ ID NO: 1 or a variant with 95% identity to SEQ ID NO: 1. SEQ ID NO: 1 and 2 of the present application are from *Corynebacterium diphtheriae*. Thus, the metF disclosed in Bathe I is different than the metF required by all the claims of the present application. Therefore, Bathe I does not disclose every limitation of the claims and does not anticipate the claims.

Claims 1-12, and 14 were also rejected as being anticipated by Bathe et al. (US 2002/0110877, now U.S. Patent No. 6,942,996, hereinafter "Bathe II"). Applicants respectfully traverse that Bathe II anticipates any currently pending claims.

The Examiner alleges that Bathe II discloses the sequence of a metF (SEQ ID NO: 2) having 349 amino acid residues from *Corynebacterium glutamicum*, which is alleged to be 70% identical to SEQ ID NO: 2 of the present application. Even assuming that is correct, there is no anticipation of claims reciting an amino acid having 95% or more homology to SEQ ID NO: 2. Moreover, Bathe II relates to polynucleotides and methods which relate to metE, and does not disclose metF. MetE and metF have different activities, different sequences, and catalyze

different reactions. The metE gene encodes homocysteine methyltransferase I while the metF gene encodes methylenetetrahydrofolate reductase.

Because the sequences and methods disclosed in either of Bathe I and Bathe II are different than those claimed in the present invention, neither of the Bathe references disclose every limitation of the claims. Therefore, neither of the Bathe references anticipates the claims. Reconsideration and withdrawal of this rejection is respectfully requested.

Conclusion

For at least the above reasons, Applicants respectfully request withdrawal of the rejections and allowance of the claims.

Applicants reserve all rights to pursue the non-elected claims and subject matter in one or more divisional applications, if necessary.

Accompanying this response is a Petition for a three-month extension of time to and including January 16, 2007 pursuant to 37 CFR § 1.7, to respond to the Office Action mailed July 14, 2006 with the required fee authorization for the extension. No further fees are believed due. If any additional fee is due, the Director is hereby authorized to charge our Deposit Account No. 03-2775, under Order No. 13111-00005-US from which the undersigned is authorized to draw.

Respectfully submitted,

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